equitrans Midstream

2200 Energy Drive
Canonsburg, PA 15317
equitransmidstream.com

January 31, 2019

William F. Durham, Director
WVDEP
Division of Air Quality
601 57th Street SE
Charleston, WV 25304

RE: ***R13 Permit Application***
Curtisville #50 Compressor Station
Facility ID No: 049-00052

Dear Mr. Durham:

Equitrans, LP (Equitrans) is submitting this R13 modification application for its natural gas compressor station located in Marion County, West Virginia ("Curtisville Compressor Station). This station is currently operating under permits R30-049-00052-2013 and G60-C084. This permit application is being filed to replace a dehydration unit at the compressor station.

With this enclosed application, Equitrans has attached the appropriate forms for the application as well as the $1000 application fee check made payable to the "WVDEP – Division of Air Quality."

Equitrans appreciates your review of this application. If you have any questions or comments about the attached information or have additional information requirements, please feel free to contact me at (412) 400-6887 or at KrRyan@equitransmidstream.com.

Sincerely,

Kristin Ryan
Manager, Environmental

PROJECT REPORT

Equitrans, LP > Curtisville Compressor Station

equitrans Midstream

Marion County, West Virginia

Prepared By:

TRINITY CONSULTANTS
4500 Brooktree Rd.
Suite 103
Wexford, PA 15090
(724) 935-2611

January 2019

Trinity Consultants

Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

Equitrans, LP (Equitrans) is submitting this modification application to the West Virginia Department of Environmental Protection (WVDEP) for the natural gas compressor station located in Marion County, West Virginia (Curtisville Compressor Station). Specifically, this application seeks authorization to install a new dehydration unit and associated enclosed combustor to replace the existing dehydration unit. The Curtisville Compressor Station is currently operating in accordance with WVDEP Title V Operating Permit No. R30-04900052-2017, issued on October 30, 2017.

1.1. FACILITY AND PROJECT DESCRIPTION

The Curtisville Compressor Station is a natural gas transmission facility covered under Standard Industrial Classification (SIC) code 4922. The facility has the potential to operate 24 hours per day, and 7 days per week. The station is currently permitted for the following equipment:

- One (1) natural gas fired Clark HRA8 compressor engine, rated at 1,100 horsepower (hp);
- One (1) natural gas fired Kohler 50-RZ generator engine, rated at 125 hp;
- One (1) natural gas fired Kohler 25REZG emergency generator engine, rated at 44 hp;
- One (1) natural gas fired heating boiler, rated at 1.25 MMBtu/hr;
- One (1) triethylene glycol (TEG) dehydration unit rated at 35 million standard cubic feet per day (MMSCFD) with associated reboiler (rated at 0.35 MMBtu/hr) and flare (rated at 0.08 MMBtu/hr); and
- Four (4) miscellaneous storage tanks (4,000 gallons or less, each).

With this application, Equitrans is proposing to install a new 60 MMSCFD TEG dehydration unit and associated reboiler (rated at 1.54 MMBtu/hr) to replace the existing unit and reboiler. The new unit will be controlled by an enclosed combustor, rated at 6 MMBtu/hr.

1.2. R-13 APPLICATION ORGANIZATION

This R-13 permit application is organized as follows:

- Section 2: Sample Emission Source Calculations;
- Section 3: R-13 Application Form;
- Attachment A: Business Certificate;
- Attachment B: Map;
- Attachment C: Installation and Start Up Schedule;
- Attachment D: Regulatory Discussion;
- Attachment E: Plot Plan;
- Attachment F: Detailed Process Flow Diagram;
- Attachment G: Process Description;
- Attachment I: Emission Units Table;
- Attachment J: Emission Points Data Summary Sheet
- Attachment K: Fugitive Emissions Data Summary Sheet;
- Attachment L: Emissions Unit Data Sheets
- Attachment M: Air Pollution Control Device Sheet;
- Attachment N: Supporting Emission Calculations;
- Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans;
- Attachment P: Public Notice; and
- Attachment S: Title V Permit Revision Information; and
- Application Fee

2. SAMPLE EMISSION SOURCE CALCULATIONS

The proposed changes are limited to volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions from the operation of the dehydration unit. As the proposed project will include the removal of the existing dehydration unit, the overall fugitive component count from the facility is not anticipated to increase as a result of the proposed project.

Potential emissions of HAPs, VOC, and methane from the proposed dehydration unit are calculated using GRI-GLYCalc. Emissions of other criteria pollutants are calculated for natural gas combustion in the enclosed combustor and reboiler using U.S. EPA's AP-42 factors for external combustion of natural gas. Greenhouse gas emissions from combustion in the combustor and reboiler are calculated according to the procedures in 40 CFR 98 Subpart C.

3. R13 APPLICATION FORM

The WVDEP permit application forms contained in this application include all applicable R13 application forms including the required attachments.

WEST VIRGINIA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Equitrans, LP

2. Federal Employer ID No. ***(FEIN):***
25-0724685

3. Name of facility *(if different from above):*
Curtisville #50 Compressor Station

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
2200 Energy Dr.
Canonsburg, PA 15317

5B. Facility's present physical address:
Laurel Run Left Road, Mannington District
Marion County, WV

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**
- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: EQT Corporation

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**
- If **YES,** please explain: Applicant owns site
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Natural Gas Compressor Station

10. North American Industry Classification System **(NAICS)** code for the facility:
486210

11A. DAQ Plant ID No. (for existing facilities only):
049-00052

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R30-04900052-2017; G60-C084

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B.**

From Mannington, take Buffalo St (Rte 1) heading west for approximately 5 miles. Turn left on Curtisville Pike (Rte 7) and follow for about 1 mile. Turn right on Laurel Run Rd. Entrans to station is 1000 feet on the right.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Laurel Run Road	Mannington	Marion
12.E. UTM Northing (KM): 4,375.025	12F. UTM Easting (KM): 548.149	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
Equitrans is proposing to replace the existing dehydration unit and flare with a new 60 MMscfd unit, associated reboiler, and enclosed combustor.

14A. Provide the date of anticipated installation or change: / / – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: ASAP

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17. **Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18. **Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known)*. A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known)*. Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) .
– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**
– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☐ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify : TEG Dehydration Unit

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☒ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ *(Please use blue ink)* DATE: 1-28-19 *(Please use blue ink)*

35B. Printed name of signee: Jack Mackin		35C. Title: Vice President of Operations
35D. E-mail: JaMackin@equitransmidstream.com	36E. Phone:	36F. FAX:
36A. Printed name of contact person (if different from above): Nevin Edwards		36B. Title: Engineer II
36C. E-mail: NeEdwards@equitransmidstream.com	36D. Phone: 724-271-7793	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

☒ **Attachment A: Business Certificate**
☒ **Attachment B: Map(s)**
☒ **Attachment C: Installation and Start Up Schedule**
☒ **Attachment D: Regulatory Discussion**
☒ **Attachment E: Plot Plan**
☒ **Attachment F: Detailed Process Flow Diagram(s)**
☒ **Attachment G: Process Description**
☐ **Attachment H: Material Safety Data Sheets (MSDS)**
☒ **Attachment I: Emission Units Table**
☒ **Attachment J: Emission Points Data Summary Sheet**
☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
☒ **Attachment L: Emissions Unit Data Sheet(s)**
☒ **Attachment M: Air Pollution Control Device Sheet(s)**
☒ **Attachment N: Supporting Emissions Calculations**
☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
☒ **Attachment P: Public Notice**
☐ **Attachment Q: Business Confidential Claims**
☐ **Attachment R: Authority Forms**
☒ **Attachment S: Title V Permit Revision Information**
☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
☐ ***For Title V Administrative Amendments:***
  ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
☐ ***For Title V Minor Modifications:***
  ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  ☐ ***EPA has 45 day review period of a draft permit.***

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A

Current Business Certificate

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
EQUITRANS LIMITED PARTNERSHIP
DBA EQT MIDSTREAM
1710 PENNSYLVANIA AVE
CHARLESTON, WV 25302-3934

BUSINESS REGISTRATION ACCOUNT NUMBER: **1023-5643**

This certificate is issued on: 06/22/2011

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.4
L1891744896

ATTACHMENT B

Map

ATTACHMENT B - AREA MAP

Figure 1 - Map of Curtisville Station

UTM Northing (KM): 4,375.025
UTM Easting (KM): 548.149

ATTACHMENT C

Startup and Installation Schedule

Schedule of Planned Installation and Start-Up

Installation will begin upon issuance of the permit. Startup is anticipated immediately once construction is completed.

ATTACHMENT D

Regulatory Discussion

Regulatory Applicability

This section documents the applicability determinations made for Federal and State air quality regulations. The monitoring, recordkeeping, reporting, and testing plan is presented in Attachment O. In this section, applicability or non-applicability of the following regulatory programs is addressed:

- Prevention of Significant Deterioration (PSD) permitting;
- Title V of the 1990 Clean Air Act Amendments;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAP); and
- West Virginia State Implementation Plan (SIP) regulations.

In addition to providing a summary of applicable requirements, this section of the application also provides non-applicability determinations for certain regulations, allowing the WVDEP to confirm that identified regulations are not applicable to the proposed project. Note that explanations of non-applicability are limited to those regulations for which there may be some question of applicability specific to the operations at the Curtisville Compressor Station. Regulations that are categorically non-applicable are not discussed.

Prevention of Significant Deterioration Source Classification

Federal construction permitting programs regulate new and modified sources of attainment pollutants under PSD and new and modified sources of non-attainment pollutants under Non-Attainment New Source Review (NNSR). PSD and NNSR regulations apply when a major source makes a change, such as installing new equipment or modifying existing equipment, and a significant increase in emissions results from the change. The Curtisville Compressor Station is located in Marion County, which is designated as an attainment area.[1] As such, PSD regulations are applicable.

The Curtisville Compressor Station will remain a minor source with respect to the PSD program after the project since its potential emissions are below all the PSD thresholds. As such, PSD permitting is not triggered by this construction activity.

Title V Operating Permit Program

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in West Virginia Code of State Regulations (CSR) 45-30. The major source thresholds with respect to the West Virginia Title V operating permit program regulations are 10 tons per year (tpy) of a single HAP, 25 tpy of any combination of HAP, and 100 tpy of all other regulated pollutants. Potential emissions of NO_x exceed 100 tpy. Therefore, the Curtisville Compressor Station is a major source with respect to the Title V permit program. Equitrans has included the necessary Title V application forms in Attachment S to this application to revise the current Title V permit.

New Source Performance Standards

New Source Performance Standards (NSPS), located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable

[1] U.S. EPA Greenbook, http://www.epa.gov/airquality/greenbook/anayo_wv.html, as of November 30, 2018.

provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except where expressly noted.

Equitrans is proposing to install a new glycol dehydrator as part of this project. The proposed glycol dehydrator is not an affected facility under potentially applicable NSPS (e.g., OOOO and OOOOa) and the glycol circulation pump is electronic and also excluded from the definition of pneumatic pump in 60.5430a. Furthermore, the proposed project does not involve the installation of new compressors. As such, the project does not trigger a modification to the compressor station under 60.5365a(j).

National Emission Standards for Hazardous Air Pollutants

Part 63 NESHAP allowable emission limits are established on the basis of a maximum achievable control technology (MACT) determination for a particular major source. A HAP major source is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP.

Note that Subpart HHH has specific major source applicability criteria (i.e., excluding engine emissions from the major source determination). The Curtisville Compressor Station is an Area (minor) source of HAP since its potential emissions of HAP are less than the 10/25 major source thresholds.

The only potentially applicable MACT standard for the proposed project is 40 CFR 63 Subpart HHH – Natural Gas Transmission and Storage Facilities. This MACT subpart applies to facilities which are major sources of HAP that transport or store natural gas prior to entering the transmission pipeline to end users as defined by 40 CFR §63.1271. The Curtisville Compressor Station is a natural gas transmission facility and is potentially subject to this subpart. However, the Curtisville Compressor Station is an area source based on the criteria of this MACT. Therefore, the requirements of this subpart do not apply.

West Virginia SIP Regulations

The Curtisville Compressor Station is potentially subject to regulations contained in the West Virginia Code of State Regulations, Chapter 45 (Code of State Regulations). The Code of State Regulations fall under two main categories, those regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., PM standards for manufacturing equipment).

45 CSR 2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

45 CSR 2 applies to fuel burning units, defined as equipment burning fuel "for the primary purpose of producing heat or power by indirect heat transfer". The reboiler is a fuel burning unit and therefore must comply with this regulation. Per 45 CSR 2-3, opacity of emissions from units shall not exceed 10 percent, based on a six-minute block average.

45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

According to 45 CSR 4-3:

No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

The Curtisville Compressor Station is generally subject to this requirement. However, due to the nature of the process at the station, production of objectionable odor from the compressor station during normal operation is unlikely.

45 CSR 6: Control of Air Pollution from the Combustion of Refuse

45 CSR 6 applies to activities involving incineration of refuse, defined as "the destruction of combustible refuse by burning in a furnace designed for that purpose. For the purposes of this rule, the destruction of any combustible liquid or gaseous material by burning in a flare or flare stack, thermal oxidizer or thermal catalytic oxidizer stack shall be considered incineration." The proposed dehydrator combustor is an incinerator and therefore must comply with this regulation.

Per 45 CSR 6-4.3, opacity of emissions from these units shall not exceed 20 percent, except as provided by 4.4. PM emissions from this unit will not exceed the levels calculated in accordance with 6-4.1 as demonstrated in the emission calculations in Attachment N.

45 CSR 10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

This rule potentially applies to fuel burning units, including the glycol dehydration unit reboiler. Per 45 CSR 10-10.1, units rated less than 10 MMBtu/hr are exempt from the SO_2 emission limitations and testing, monitoring, recordkeeping, and reporting requirements of this rule. The reboiler is rated less than 10 MMBtu/hr and as such is exempt from this rule.

45 CSR 16: Standards of Performance for New Stationary Sources

45 CSR 16-1 incorporates the federal Clean Air Act (CAA) standards of performance for new stationary sources set forth in 40 CSR Part 60 by reference. As such, by complying with all applicable requirements of 40 CFR Part 60 at the Curtisville Compressor Station, Equitrans will be complying with 45 CSR 16.

45 CSR 17: To Prevent and Control Particulate 45 CSR 17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

According to 45 CSR 17-3.1:

No person shall cause, suffer, allow or permit fugitive particulate matter to be discharged beyond the boundary lines of the property lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution.

Due to the nature of the activities at the Curtisville Compressor Station it is unlikely that fugitive particulate matter emissions will be emitted under normal operating conditions. However, Equitrans will take measures to ensure any fugitive particulate matter emissions will not cross the property boundary should any such emissions occur.

45 CSR 34: Emissions Standards for Hazardous Air Pollutants

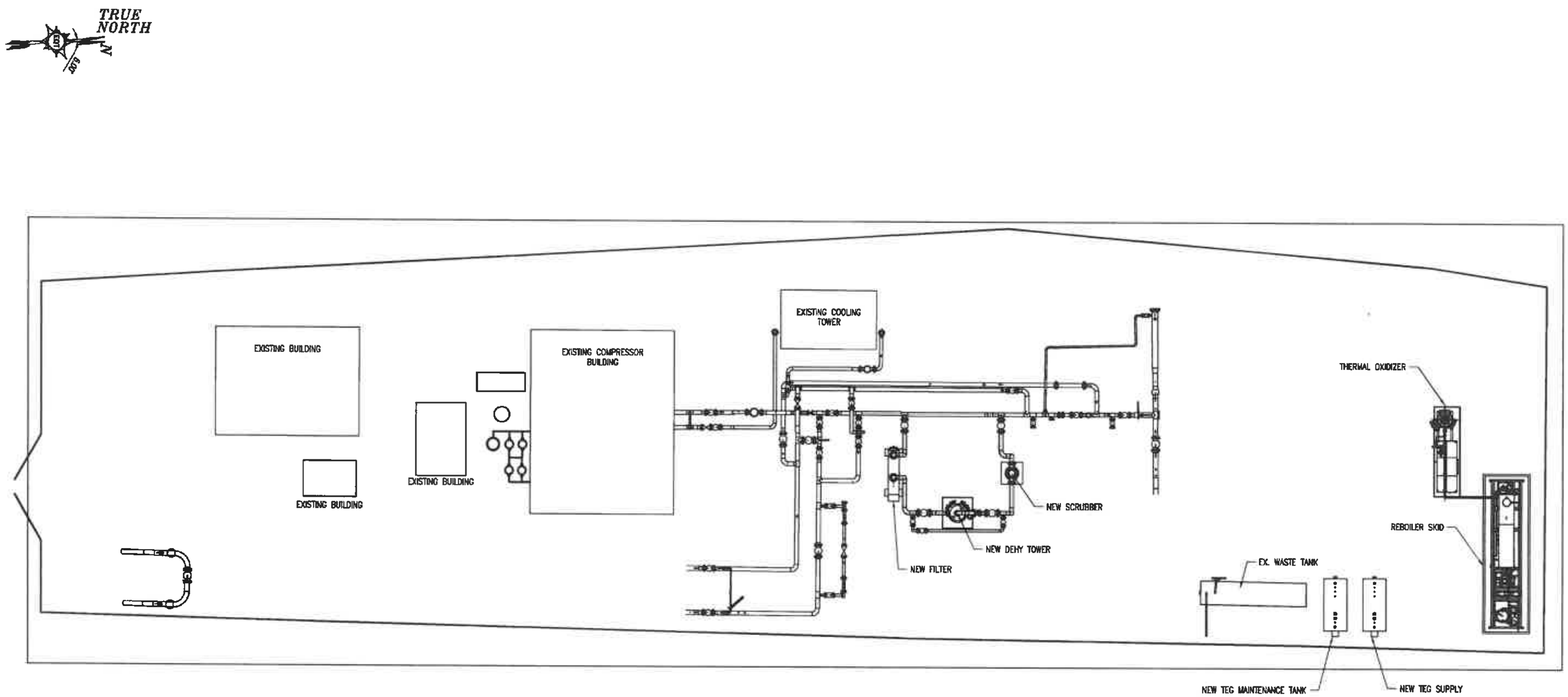
45 CSR 34-1 incorporates the federal Clean Air Act (CAA) national emissions standards for hazardous air pollutants (NESHAPs) as set forth in 40 CPR Parts 61 and 63 by reference. As such, by complying with all applicable requirements of 40 CFR Parts 61 and 63 at the Curtisville Compressor Station, Equitrans will be complying with 45 CSR 34.

Non-Applicability of Other SIP Rules

An examination of the West Virginia SIP rules with respect to applicability at the Curtisville Compressor Station reveals many SIP regulations that do not apply or impose additional requirements on operations. Such SIP rules include those specific to a particular type of industrial operation that is categorically not applicable to the Curtisville Compressor Station.

ATTACHMENT E

Plot Plan



REFERENCE DRAWINGS: DRAWING NUMBER	DRAWING TITLE	NO.	DATE	REVISION	BY	CHK	APPD	NO.	DATE	REVISION	BY	CHK	APPD
		0	4/24/19	ISSUED FOR CONSTRUCTION	RSD	CM	-						

TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE GUIDELINES AND SPECIFICATIONS

CLYDE MASTON — MECHANICAL DESIGN ENGINEER — 4/24/19 DATE

EE NAME — ELECTRICAL DESIGN ENGINEER — 4/24/19 DATE

NOTE: ANY CHANGES TO THE DESIGN SHOWN ON THIS DRAWING MUST BE APPROVED BY THE DESIGN ENGINEER.

EQT DESIGN ENGINEERING

PROJECT ID: C14136

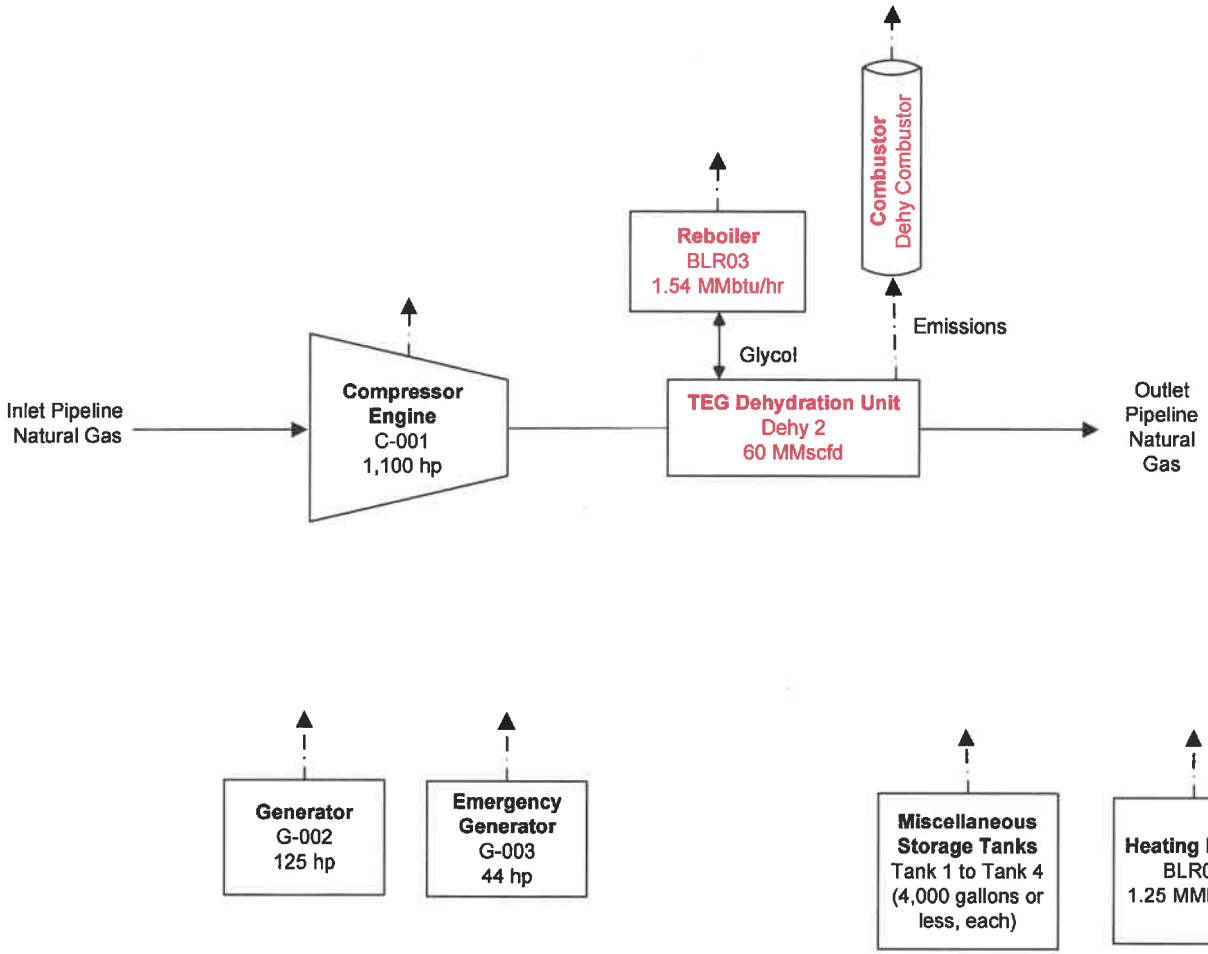
DRAWING SCALE: 3/32" = 1'-0"

DRAWING TITLE:
CURTISVILLE COMPRESSOR STATION
MECHANICAL
PLOT PLAN – AIR PERMIT

FACILITY	STATE	IDENTIFICATION	SERIES	SHEET	REVISION
C	W	CUR	1100	01	0

ATTACHMENT F

Detailed Process Flow Diagram



equitrans Midstream

Equitrans, LP

Flow Legend

Gas/Liquid Flow

Stack Emissions

Process Flow Diagram

Curtisville Station

Trinity Consultants

January 2019

ATTACHMENT G

Process Description

Process Description

The Curtisville Compressor Station compresses and dehydrates natural gas and transports downstream along the pipeline system. Equitrans is submitting this application to replace the existing glycol dehydration unit, associated reboiler, and flare with a new 60 MMSCFD unit, associated reboiler (1.5 MMbtu/hr) and enclosed combustor for control. The remaining equipment at the facility will remain unchanged.

A process flow diagram is included as Attachment F.

ATTACHMENT I

Emission Units Table

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
C-001	C-001	Reciprocating Engine / Integral Compressor Clark, Model No. HRA8, Serial No. A-25900	1973	1,100 HP	Existing	None
G-002	G-002	Reciprocating Engine / Generator Kohler, Model No. 50 RZ-Ford	Mid 1990s	125 HP	Existing	None
G-003	G-003	Reciprocating Engine / Generator Kohler, Model No. 25REZG	2015	44 HP	Existing	None
Dehy	Dehy Flare	TEG Dehydrator	1972	35 MMSCFD	Removed	Dehy Flare
Dehy Flare	Dehy Flare	Dehy Flare F1500 Model No. 44X1339	1990	0.08 MMBtu/hr	Removed	None
BLR01	BLR01	Heating Boiler	1994	1.25 MMBtu/hr	Existing	None
BLR02	BLR02	Dehydration Reboiler	1993	0.35 MMBtu/hr	Removed	None
Tank 1	Tank 1	Pipeline Condensate	1996	4,000 gallon	Existing	None
Tank 2	Tank 2	Triethylene Glycol	1996	500 gallon	Existing	None
Tank 3	Tank 3	Hydrate Inhibitor-Multi-chem MCMX5-2026	1996	330 gallon	Existing	None
Tank 4	Tank 4	Compressor Oil – CITGO Pacemaker 1035	1996	1,000 gallon	Existing	None
Dehy2	Dehy Combustor	TEG Dehydrator	2019	60 MMSCFD	New	Dehy Combustor
Dehy Combustor	Dehy Combustor	Enclosed Combustor	2019	6.0 MMBtu/hr	New	None
BLR03	BLR03	Dehydration Reboiler	2019	1.54 MMBtu/hr	New	None

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

ATTACHMENT J

Emission Points Data Summary Sheet

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
C-001	Upward Vertical stack	C-001	Compressor Engine	NA	NA	NA	NA	NOx CO SO2 PM/PM10/PM2.5 VOC HAPs CO2e	28.94 3.52 0.01 0.44 1.10 0.73 1,069	126.77 15.44 0.02 1.94 4.80 3.18 4,678	28.94 3.52 0.01 0.44 1.10 0.73 1,069	126.77 15.44 0.02 1.94 4.80 3.18 4,678	Gas/Vapor	O[A,B]	
G-002	Upward Vertical Stack	G-002	Generator Engine	NA	NA	NA	NA	NOx CO SO2 PM/PM10/PM2.5 VOC HAPs CO2e	0.70 1.18 <0.01 0.01 0.01 0.01 37	3.08 5.18 <0.01 0.03 0.04 0.04 163	0.70 1.18 <0.01 0.01 0.01 0.01 37	3.08 5.18 <0.01 0.03 0.04 0.04 163	Gas/Vapor	O[A,B]	
G-003	Upward Vertical Stack	G-003	Generator Engine	NA	NA	NA	NA	NOx CO SO2 PM/PM10/PM2.5 VOC HAPs CO2e	0.52 2.14 <0.01 0.01 0.52 0.01 48	0.13 0.54 <0.01 <0.01 0.13 <0.01 12	0.52 2.14 <0.01 0.01 0.52 0.01 48	0.13 0.54 <0.01 <0.01 0.13 <0.01 12	Gas/Vapor	O[A,B]	
Dehy Combustor	Upward Vertical Stack	Dehy2	Dehy & Enclosed Combustor	Dehy Combustor	Enclosed Flare	NA	NA	NOx CO SO2 PM/PM10/PM2.5 VOC Methane CO2e HAP Benzene Toluene Ethlybenzene Xylene n-hexane	NA NA NA NA 14.74 25.47 638 7.78 0.91 1.57 2.33 2.78 0.18	NA NA NA NA 64.54 111.56 2,795 34.08 3.97 6.86 10.18 12.17 0.79	0.54 0.45 <0.01 0.04 0.32 0.52 717 0.16 0.02 0.03 0.05 0.06 <0.01	2.36 1.98 0.01 0.18 1.42 2.29 3,139 0.68 0.08 0.14 0.20 0.24 0.02	Gas/Vapor	O[A,B,C]	

BLR03	Upward Vertical Stack	BLR03	Dehy Reboiler	NA	NA	NA	NA	NOx CO SO2 PM/PM10/PM2.5 VOC HAPs CO2e	0.14 0.12 <0.01 0.01 0.01 <0.01 175	0.61 0.51 <0.01 0.05 0.03 0.01 765	0.14 0.12 <0.01 0.01 0.01 <0.01 175	0.61 0.51 <0.01 0.05 0.03 0.01 765	Gas/Vapor	O[A,B]	
BLR01	Upward Vertical Stack	BLR01	Heating Boiler	NA	NA	NA	NA	NOx CO SO2 PM/PM10/PM2.5 VOC HAPs CO2e	0.11 0.09 <0.01 0.01 0.01 <0.01 142	0.49 0.41 <0.01 0.04 0.03 0.01 621	0.11 0.09 <0.01 0.01 0.01 <0.01 142	0.49 0.41 <0.01 0.04 0.03 0.01 621	Gas/Vapor	O[A,B]	

A- AP-42. See attachment N for additional details.
B- 40 CFR 98, Subpart C for natural gas fired combustion.
C- GRI-GLYCalc

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K

Fugitive Emissions Data Summary Sheet

LEAK SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components[1]	Number of Components Monitored by Frequency[2]	Average Time to Repair (days)[3]	Estimated Annual Emission Rate (lb/yr)[4]
Pumps[5]	light liquid VOC[6,7]				
	heavy liquid VOC[8]				
	Non-VOC[9]				
Valves[10]	Gas VOC	60	0		179
	Light Liquid VOC				
	Heavy Liquid VOC				
	Non-VOC				
Safety Relief Valves[11]	Gas VOC				
	Non VOC				
Open-ended Lines[12]	VOC	3	0		4
	Non-VOC				
Sampling Connections[13]	VOC	400	0		53
	Non-VOC				
Compressors	VOC				
	Non-VOC				
Flanges	VOC	300	0		77
	Non-VOC				
Other	VOC	40	0		233
	Non-VOC				

[1 - 13] See notes on the following page.

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% w/w VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.

2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in ppm. Do not include monitoring by visual or soap-bubble leak detection methods. "M/Q(M)/Q/SA/A/O" means the time period between inspections as follows:

   Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/Other (specify time period)

   If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category "valves, gas service:" 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.

4. Note the method used: MB - material balance; EE - engineering estimate; EPA - emission factors established by EPA (cite document used); O - other method, such as in-house emission factor (specify).

5. Do not include in the equipment count sealless pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)

6. Volatile organic compounds (VOC) means the term as defined in 40 CFR □51.100 (s).

7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a light liquid.

8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a heavy liquid.

9. LIST CO, H_2S, mineral acids, NO, NO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.

11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.

12 Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.

13. Do not include closed-purge sampling connections.

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☐ Yes ☒ No (No change associated with this project) ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☒ Yes ☐ No (No change associated with this project) ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No ☒ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	NA	--	--	--	--	--
Unpaved Haul Roads	NA	--	--	--	--	--
Storage Pile Emissions	NA	---	---	---	---	---
Road Packing Emissions	VOC HAP	---	0.29 <0.01	---	0.29 <0.01	O[B]
Wastewater Treatment Evaporation & Operations	NA	---	---	---	---	---
Equipment Leaks	VOC HAP	N/A	0.27 <0.01	N/A	0.27 <0.01	O[A]
General Clean-up VOC Emissions	NA	---	---	---	---	---
Other – Blowdowns, ESD and Pigging Events	VOC HAP	N/A	0.31 <0.01	N/A	0.31 <0.01	O[B]

A – Oil *and Gas Production Operations Average Emission Factors*, Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, Table 2-4, November 1995, 40 CFR 98 Subpart W, and mass balance.

B - Mass Balance

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

ATTACHMENT L

Emissions Unit Data Sheet

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): DEHY2

1. Name or type and model of proposed affected source: 60 MMSCFD dehydration unit with 1.54 MMBtu/hr heat input rated reboiler
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: 60 million standard cubic feet per day of natural gas
4. Name(s) and maximum amount of proposed material(s) produced per hour: Does not produce a material – removes water from wet natural gas
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: External combustion of natural gas in reboiler

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Reboiler - Natural gas – 1,382 scfh

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Natural gas with negligible H_2S and ash content.

(c) Theoretical combustion air requirement (ACF/unit of fuel):

Unknown @ °F and psia.

(d) Percent excess air: Unknown

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

natural gas fired external combustion heater – 1.54 MMbtu/hr input rating

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

NA

(g) Proposed maximum design heat input: 1.54 × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:			
@ Unknown °F and			psia
a. NO_X	0.14	lb/hr	grains/ACF
b. SO_2	<0.01	lb/hr	grains/ACF
c. CO	0.12	lb/hr	grains/ACF
d. PM_{10}	0.01	lb/hr	grains/ACF
e. Hydrocarbons		lb/hr	grains/ACF
f. VOCs	14.74	lb/hr	grains/ACF
g. Pb		lb/hr	grains/ACF
h. Specify other(s)			
HAPs	7.78	lb/hr	grains/ACF
Benzene	0.91	lb/hr	grains/ACF
Toluene	1.57	lb/hr	grains/ACF
Ethylbenzene	2.33	lb/hr	grains/ACF
Xylene	2.78	lb/hr	grains/ACF
n-hexane	0.18	lb/hr	grains/ACF

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
Throughput of wet natural gas. Operating parameters of dehydration unit for GLYCalc (temperature, pressure, glycol flow rate) Conduct visual inspections one per month confirming the pilot is lit	Maintain records of the times and duration of all periods which the pilot flame was absent
REPORTING	**TESTING**
None.	

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

ATTACHMENT M

Air Pollution Control Device Sheet

Attachment M
Air Pollution Control Device Sheet
(FLARE SYSTEM)

Control Device ID No. (must match Emission Units Table): Dehy Combustor

Equipment Information

1. Manufacturer: Envirotherm (or similar)
Model No. ETI-DVC-36 (or similar)

2. Method:
☐ Elevated flare
☐ Ground flare
☒ Other
Describe Enclosed Flare

3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.

4. Method of system used:
☐ Steam-assisted ☐ Air-assisted ☐ Pressure-assisted ☒ Non-assisted

5. Maximum capacity of flare:
scf/min
scf/hr

6. Dimensions of stack:
Diameter 3 ft.
Height 20 ft.

7. Estimated combustion efficiency:
(Waste gas destruction efficiency)
Estimated: > 98 %
Minimum guaranteed: > 98 %

8. Fuel used in burners:
☒ Natural Gas
☐ Fuel Oil, Number
☐ Other, Specify:

9. Number of burners: One (1)
Rating: 6 MMBTU/hr

10. Will preheat be used? ☐ Yes ☒ No

11. Describe method of controlling flame:

12. Flare height: 20 ft

13. Flare tip inside diameter: 28 inches ft

14. Natural gas flow rate to flare pilot flame per pilot light:
scf/min
NA scf/hr

15. Number of pilot lights: One (1) Burner
Total 2 MMBTU/hr

16. Will automatic re-ignition be used?
☒ Yes ☐ No

17. If automatic re-ignition will be used, describe the method:

18. Is pilot flame equipped with a monitor? ☒ Yes ☐ No
If yes, what type? ☒ Thermocouple ☐ Infra-Red
☐ Ultra Violet ☐ Camera with monitoring control room
☐ Other, Describe:

19. Hours of unit operation per year: 8760

Steam Injection

20. Will steam injection be used? ☐ Yes ☒ No	21. Steam pressure PSIG Minimum Expected: Design Maximum:
22. Total Steam flow rate: LB/hr	23. Temperature: °F
24. Velocity ft/sec	25. Number of jet streams
26. Diameter of steam jets: in	27. Design basis for steam injected: LB steam/LB hydrocarbon
28. How will steam flow be controlled if steam injection is used?	

Characteristics of the Waste Gas Stream to be Burned

29. Name	Quantity Grains of H_2S/100 ft^3	Quantity (LB/hr, ft^3/hr, etc)	Source of Material
See attached emissions calculations			

30. Estimate total combustible to flare: 56.28 (from GLYcalc) LB/hr (Maximum mass flow rate of waste gas) scfm	
31. Estimated total flow rate to flare including materials to be burned, carrier gases, auxiliary fuel, etc.: 8,897 scfh	
32. Give composition of carrier gases:	
33. Temperature of emission stream: >100 °F Heating value of emission stream: 8 to 1,057 BTU/ft^3 Mean molecular weight of emission stream: MW = lb/lb-mole	34. Identify and describe all auxiliary fuels to be burned. BTU/scf BTU/scf BTU/scf BTU/scf BTU/scf
35. Temperature of flare gas: 1450-1600 °F	36. Flare gas flow rate: 660 scf/min
37. Flare gas heat content: 8 to 1,057 BTU/ft^3	38. Flare gas exit velocity: 9.34 ft/sec
39. Maximum rate during emergency for one major piece of equipment or process unit: scf/min	
40. Maximum rate during emergency for one major piece of equipment or process unit: BTU/min	
41. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):	
42. Describe the collection material disposal system:	
43. Have you included ***Flare Control Device*** in the Emissions Points Data Summary Sheet?	

44. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING: Presence of pilot (temperature)	RECORDKEEPING: Maintain records of the times and duration of all periods where the pilot flame was absent Maintain records of visible emission opacity tests
REPORTING: None	TESTING: Conduct a Method 22 opacity test as required

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
VOC – 100%
HAP – 100%

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
VOC – 98%
HAP – 98%

47. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

ENVIROTHERM INTERNATIONAL™

Flare Stacks – Thermal Oxidizers – Burners & Controls

PROPOSAL
FOR
Equitrans – Curtisville DEHY

36-DVC

Customer: Equitrans Midstream
Attn: Clyde Maston
(304) 543-7256

Prepared By:
Chuck Stephenson

cstephenson@irsvc.com

Date Prepared: November 16, 2018
Proposal Number: 18186 Rev 0

ENVIROTHERM

Technical Summary

Standard Design Conditions: Curtisville DEHY 650 MMSCFD

Process Inlet Stream: Based on GRI-Gly Calc Output:

Overhead Still 4" Inlet	
Inlet Temperature:	212°F
Inlet Pressure:	≥ 2" WC
Flow Rate:	8450 SCFH
Net Heat Release:	8 BTU/FT^3
Flash Gas 1" Inlet	
Inlet Temperature:	130°F
Inlet Pressure:	35 PISG
Flow Rate:	447 SCFH
Net Heat Release:	1057 BTU/FT^3
36" Combustion Chamber	
Exit Diameter:	28 IN I.D.
Mass Flow @ 1450°F:	143,629 ACFH
Exit Velocity:	9.34 FT/SEC
DVC's Max Heat Design Load:	6 MMBTU/HR
Designed Heat Load:	0.6 MMBTU/HR
Combustion Chamber Temp:	1450 – 1600 °F
Destruction Efficiency:	≥98.0%
Residence Time:	≥1.8 Sec.

Site Conditions	
Wind Speed:	105 MPH
Seismic Zone:	1
Elevation:	1,200 FASL
Humidity:	High

Utiilities	
Gas Service Required for Burner:	1000 SCFH – Natural Gas intermittent use, only on when temperature < 1450 °F
Electrical Service Required:	24 VDC, 5 Amps
Gas Consumption at Start-up:	1.0 MMBtu/hr
Gas Consumption under load:	≤ 400 SCFH, Dependant on BTU value of waste stream

ATTACHMENT N

Supporting Emission Calculations

Company Name: Equitrans, LP
Facility Name: Curtisville Station
Project Description: R13 Permit Application

	Facility-Wide Emissions Summary								Total Potential Emissions	Project Increase Emissions
	Clark Compressor Engine	Kohler 50 RZ Generator	Kohler 25 REZG Generator	TEG Dehy Unit	Dehydration Combustor	Dehy Reboiler	Heating Boiler	Fugitives & Blowdowns		
Emission Unit ID	C-001	G-002	G-003	Dehy2	Dehy Combustor	BLR03	BLR01			
Fuel Type	Natural Gas	Natural Gas	Natural Gas	---	Natural Gas	Natural Gas	Natural Gas			
Capacity	1,100	125	44	60	6.00	1.54	1.25			
Unit	HP	HP	HP	MMSCFD	MMBtu/hr	MMBtu/hr	MMBtu/hr			
Operating Hours (hrs)	8,760	8,760	500	8,760	8,760	8,760	8,760	8,760		
# of Emission Units	1	1	1	1	1	1	1	N/A		
Pollutant	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
PM_{10}	1.94	0.03	2.0E-03	--	0.18	0.05	0.04	--	2.23	0.23
$PM_{2.5}$	1.94	0.03	2.0E-03	--	0.18	0.05	0.04	--	2.23	0.23
SO_X	0.02	8.2E-04	6.0E-05	--	0.01	3.6E-03	2.9E-03	--	0.05	0.02
CO	15.44	5.18	0.54	--	1.98	0.51	0.41	--	24.06	2.49
NO_X	126.77	3.08	0.13	--	2.36	0.61	0.49	--	133.43	2.96
VOC	4.80	0.04	0.13	1.29	1.3E-01	0.03	0.03	0.87	7.32	1.45
CO_2	4,678	163	12	6.25	3,074	765	621	0.08	9,318	3,845
CH_4	0.09	3.1E-03	2.2E-04	2.23	5.8E-02	1.4E-02	0.01	16.23	19	2.30
N_2O	0.01	3.1E-04	2.2E-05	--	5.8E-03	1.4E-03	1.2E-03	--	0.02	0.01
CO_2e[1]	4,683	163	12	62	3,077	765	621	406	9,789	3,905
Formaldehyde	2.21	0.03	2.1E-03	--	--	4.5E-04	3.7E-04	--	2.24	0.00
Benzene	0.08	2.2E-03	1.6E-04	0.08	--	1.3E-05	1.0E-05	--	0.16	0.08
Toluene	0.04	7.8E-04	5.7E-05	0.14	--	2.1E-05	1.7E-05	--	0.18	0.14
Ethylbenzene	4.3E-03	3.5E-05	2.5E-06	0.20	--	--	--	--	0.21	0.20
Xylene	0.01	2.7E-04	2.0E-05	0.24	--	--	--	--	0.25	0.24
n-Hexane	0.02	---	---	0.02	--	1.1E-02	0.01	--	0.05	0.03
Total HAPs (including HCHO)	3.18	0.04	3.0E-03	0.68	--	1.1E-02	0.01	0.01	3.94	0.69

1. Conversion to CO_2e based on CH_4 GWP = 25 and N_2O GWP = 298, per 40 CFR 98.
2. VOC includes Formaldehyde.

Company Name: Equitrans, LP
Facility Name: Curtisville Station
Project Description: R13 Permit Application

Dehydrator Emission Calculations

	Regenerator						Flash Tank						Potential To Emit*			
	Uncontrolled Emissions			Controlled Emissions			Uncontrolled Emissions			Controlled Emissions			Uncontrolled		Controlled	
Pollutant	(lbs/hr)	(lbs/day)	(tons/yr)	(lbs/hr)	(lbs/day)	(tons/yr)	(lbs/hr)	(lbs/day)	(tons/yr)	(lbs/hr)	(lbs/day)	(tons/yr)	(lbs/hr)	(tons/yr)	(lbs/hr)	(tons/yr)
Carbon Dioxide	0.5220	12.5280	2.2864	0.5220	12.5280	2.2864	0.6670	16.008	2.9215	0.6670	16.008	2.9215	1.43	6.25	1.43	6.25
Methane	10.4194	250.0650	45.6368	0.2084	5.0010	0.9127	10.8052	259.325	47.3269	0.2161	5.187	0.9465	25.47	111.56	0.51	2.23
Ethane	4.3923	105.4160	19.2384	0.0878	2.1080	0.3848	9.0042	216.101	39.4384	0.1801	4.322	0.7888	16.08	70.41	0.32	1.41
Propane	0.9510	22.8240	4.1654	0.0190	0.4560	0.0833	1.5443	37.062	6.7639	0.0309	0.741	0.1353	2.99	13.12	0.06	0.26
Isobutane	0.2467	5.9210	1.0806	0.0049	0.1180	0.0216	0.3063	7.350	1.3414	0.0061	0.147	0.0268	0.66	2.91	0.01	0.06
n-Butane	0.4324	10.3770	1.8937	0.0086	0.2080	0.0379	0.4366	10.478	1.9122	0.0087	0.210	0.0382	1.04	4.57	0.02	0.09
Isopentane	0.1599	3.8380	0.7004	0.0032	0.0770	0.0140	0.1426	3.422	0.6245	0.0029	0.068	0.0125	0.36	1.59	0.01	0.03
n-Pentane	0.1134	2.7230	0.4969	0.0023	0.0540	0.0099	0.0834	2.001	0.3651	0.0017	0.040	0.0073	0.24	1.03	0.00	0.02
Cyclopentane	0.0593	1.4240	0.2599	0.0012	0.0280	0.0052	0.0109	0.262	0.0478	0.0002	0.005	0.0010	0.08	0.37	0.00	0.01
n-Hexane	0.1056	2.5340	0.4624	0.0021	0.0510	0.0092	0.0441	1.058	0.1930	0.0009	0.021	0.0039	0.18	0.79	0.00	0.02
Cyclohexane	0.1549	3.7190	0.6787	0.0031	0.0740	0.0136	0.0157	0.376	0.0686	0.0003	0.008	0.0014	0.20	0.90	0.00	0.02
Other Hexanes	0.2807	6.7360	1.2294	0.0056	0.1350	0.0246	0.1520	3.647	0.6656	0.0030	0.073	0.0133	0.52	2.27	0.01	0.05
Heptanes	0.3125	7.5010	1.3689	0.0063	0.1500	0.0274	0.0636	1.527	0.2787	0.0013	0.031	0.0056	0.45	1.98	0.01	0.04
Methylcyclohexane	0.2266	5.4380	0.9925	0.0045	0.1090	0.0198	0.0179	0.430	0.0784	0.0004	0.009	0.0016	0.29	1.29	0.01	0.03
2,2,4-Trimethylpentane	0.0152	0.3650	0.0665	0.0003	0.0070	0.0013	0.0060	0.143	0.0262	0.0001	0.003	0.0005	0.03	0.11	0.00	0.00
Benzene	0.7443	17.8640	3.2602	0.0149	0.3570	0.0652	0.0118	0.282	0.0515	0.0002	0.006	0.0010	0.91	3.97	0.02	0.08
Toluene	1.2918	31.0030	5.6580	0.0258	0.6200	0.1132	0.0130	0.312	0.0570	0.0003	0.006	0.0011	1.57	6.86	0.03	0.14
Ethylbenzene	1.9264	46.2340	8.4378	0.0385	0.9250	0.1688	0.0111	0.267	0.0488	0.0002	0.005	0.0010	2.33	10.18	0.05	0.20
Xylenes	2.3050	55.3210	10.0961	0.0461	1.1060	0.2019	0.0095	0.227	0.0415	0.0002	0.005	0.0008	2.78	12.17	0.06	0.24
C8 + Heavier Hydrocarbons	0.0839	2.0130	0.3674	0.0017	0.0400	0.0073	0.0016	0.039	0.0071	<0.0001	0.001	0.0001	0.10	0.45	<0.0001	0.01
Total Emissions	24.2215	581.3150	106.0900	0.4844	11.6260	2.1218	22.6796	544.310	99.3366	0.4536	10.886	1.9867	56.28	246.51	1.13	4.93
Total Hydrocarbon Emission	24.2215	581.3150	106.0900	0.4844	11.6260	2.1218	22.6796	544.310	99.3366	0.4536	10.886	1.9867	56.28	246.51	1.13	4.93
Total VOC Emissions	9.4098	225.8350	41.2148	0.1882	4.5170	0.8243	2.8702	68.884	12.5713	0.0574	1.378	0.2514	14.74	64.54	0.29	1.29
Total HAP Emissions	6.3884	153.3210	27.9810	0.1278	3.0660	0.5596	0.0954	2.290	0.4180	0.0019	0.046	0.0084	7.78	34.08	0.16	0.68
GHG Emissions (CO_2e)	261.0070	6264.1530	1143.2064	5.7320	137.5530	25.1039	270.7970	6499.133	1186.0940	6.0695	145.683	26.5840	638.16	2795.16	14.16	62.03

* As calculated using GRI-GLYCalc 4.0, at a worst-case emissions scenario of design rated dry gas flowrate of 60 MMscf/day, tower operating conditions of T and P of 45°F and 650 psig (respectively), flash tank conditions of T and P of 135°F and 35 psig (respectively), and maximum glycol pump rate of 10 gpm. The GLYCalc run uses the most recent extended gas analysis available for the station, and 0.0005% for all NIL compounds reported on extended gas analysis.

* Potential to emit is calculated by adding 20% compliance margin to GRI-GLYCalc results to account for variation in the extended gas analysi

Company Name: Equitrans, LP
Facility Name: Curtisville Station
Project Description: R13 Permit Application

Dehydrator Flare Emission Calculations

Source Designation:	
Manufacturer:	Envirotherm
Model:	DVC-36
Year Installed	2019
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,114
Heat Input (MMBtu/hr)	6.00
Fuel Consumption (mmscf/hr):	5.39E-03
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf)[a]	Potential Emissions (lb/hr)[b]	Potential Emissions (tons/yr)[c]
NO_x	100	0.54	2.36
CO	84	0.45	1.98
SO_2	0.6	3.2E-03	1.4E-02
PM Total	7.6	4.1E-02	1.8E-01
PM Condensable	5.7	3.1E-02	1.3E-01
PM_{10} (Filterable)	1.9	1.0E-02	4.5E-02
$PM_{2.5}$ (Filterable)	1.9	1.0E-02	4.5E-02
VOC	5.5	3.0E-02	1.3E-01
CO_2[d] (Natural Gas Firing)	116.98	701.86	3074.13
CH_4[d] (Natural Gas Firing)	0.002	1.3E-02	5.8E-02
N_2O[d] (Natural Gas Firing)	0.0002	1.3E-03	5.8E-03

[a] Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

[b] Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

[c] Annual Emissions $(tons/yr)_{Potential} = (lb/hr)_{Emissions} \times$ (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

[d] GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C and are in units of lb/MMBtu.

45-6-4 Emission Standard Calculation:

$$\text{Emissions (lb/hr)} = 5.43 \frac{56.28 \text{ lb}}{\text{hr}} \left| \frac{\text{hr}}{2000 \text{ lb}} \right.$$

$$= 0.15 \text{ lb/hr}$$

Company Name: Equitrans, LP
Facility Name: Curtisville Station
Project Description: R13 Permit Application

Dehydration Reboiler Calculations

Source Designation:	
Year Installed	2019
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,114
Heat Input (MMBtu/hr)	1.54
Fuel Consumption (mmscf/hr):	1.38E-03
Fuel Consumption (mmscf/yr):	12.11
Potential Annual Hours of Operation (hr/yr):	8,760

Criteria and Manufacturer Specific Pollutant Emission Rates:

Pollutant	Emission Factor (lb/MMscf)[a]	Potential Emissions (lb/hr)[b]	Potential Emissions (tons/yr)[c]
NO_x	100	0.14	0.61
CO	84	0.12	0.51
SO_2	0.6	8.3E-04	3.6E-03
PM Total	7.6	1.1E-02	0.05
PM Condensable	5.7	7.9E-03	0.03
PM_{10} (Filterable)	1.9	2.6E-03	1.2E-02
$PM_{2.5}$ (Filterable)	1.9	2.6E-03	1.2E-02
VOC	5.5	7.6E-03	0.03
CO_2[d] (Natural Gas Firing)	126,262	174.55	764.51
CH_4[d] (Natural Gas Firing)	2.4	3.3E-03	1.4E-02
N_2O[d] (Natural Gas Firing)	0.24	3.3E-04	1.4E-03

Company Name: Equitrans, LP
Facility Name: Curtisville Station
Project Description: R13 Permit Application

Dehydration Reboiler Calculations

Hazardous Air Pollutant (HAP) Potential Emissions:

Pollutant	Emission Factor (lb/MMscf)[a]	Potential Emissions (lb/hr)[b]	Potential Emissions (tons/yr)[c]
HAPs:			
3-Methylchloranthrene	1.80E-06	2.49E-09	1.09E-08
7,12-Dimethylbenz(a)anthracene	1.60E-05	2.21E-08	9.69E-08
Acenaphthene	1.80E-06	2.49E-09	1.09E-08
Acenaphthylene	1.80E-06	2.49E-09	1.09E-08
Anthracene	2.40E-06	3.32E-09	1.45E-08
Benz(a)anthracene	1.80E-06	2.49E-09	1.09E-08
Benzene	2.10E-03	2.90E-06	1.27E-05
Benzo(a)pyrene	1.20E-06	1.66E-09	7.27E-09
Benzo(b)fluoranthene	1.80E-06	2.49E-09	1.09E-08
Benzo(g,h,i)perylene	1.20E-06	1.66E-09	7.27E-09
Benzo(k)fluoranthene	1.80E-06	2.49E-09	1.09E-08
Chrysene	1.80E-06	2.49E-09	1.09E-08
Dibenzo(a,h) anthracene	1.20E-06	1.66E-09	7.27E-09
Dichlorobenzene	1.20E-03	1.66E-06	7.27E-06
Fluoranthene	3.00E-06	4.15E-09	1.82E-08
Fluorene	2.80E-06	3.87E-09	1.70E-08
Formaldehyde	7.50E-02	1.04E-04	4.54E-04
Hexane	1.80E+00	2.49E-03	1.09E-02
Indo(1,2,3-cd)pyrene	1.80E-06	2.49E-09	1.09E-08
Phenanthrene	1.70E-05	2.35E-08	1.03E-07
Pyrene	5.00E-06	6.91E-09	3.03E-08
Toluene	3.40E-03	4.70E-06	2.06E-05
Arsenic	2.00E-04	2.76E-07	1.21E-06
Beryllium	1.20E-05	1.66E-08	7.27E-08
Cadmium	1.10E-03	1.52E-06	6.66E-06
Chromium	1.40E-03	1.94E-06	8.48E-06
Cobalt	8.40E-05	1.16E-07	5.09E-07
Lead	5.00E-04	6.91E-07	3.03E-06
Manganese	3.80E-04	5.25E-07	2.30E-06
Mercury	2.60E-04	3.59E-07	1.57E-06
Nickel	2.10E-03	2.90E-06	1.27E-05
Selenium	2.40E-05	3.32E-08	1.45E-07
Polycyclic Organic Matter:			
Methylnaphthalene (2-)	2.40E-05	3.32E-08	1.45E-07
Naphthalene	6.10E-04	8.43E-07	3.69E-06
Total HAP		**2.61E-03**	**1.14E-02**

[a] Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

[b] Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

[c] Annual Emissions $(tons/yr)_{Potential}$ = $(lb/hr)_{Emissions}$ × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

[d] GHG Emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: EQT - Curtisville Dehy PTE
File Name: Z:\Client\EQT Corporation\West Virginia\Curtisville\Projects\183901.0271 Dehy Replacement\03 Deliverables\2019-0122 Revised Application\Attach N - Emission Calculations\2019-0122 Curtisville_DehyCalcs_v1.1.ddf
Date: January 22, 2019

DESCRIPTION:

Description: Gas analysis sample date: 9/30

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 45.00 deg. F
Pressure: 650.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	0.1490
Nitrogen	0.3870
Methane	87.2360
Ethane	11.1700
Propane	0.8080
Isobutane	0.0870
n-Butane	0.0990
Isopentane	0.0250
n-Pentane	0.0120
Cyclopentane	0.0010
n-Hexane	0.0040
Cyclohexane	0.0010
Other Hexanes	0.0160
Heptanes	0.0040
Methylcyclohexane	0.0010
2,2,4-Trimethylpentane	0.0005
Benzene	0.0005
Toluene	0.0005
Ethylbenzene	0.0005
Xylenes	0.0005
C8+ Heavies	0.0005

DRY GAS:

Flow Rate: 60.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.0 wt% H2O
Flow Rate: 10.0 gpm

PUMP:

Glycol Pump Type: Electric/Pneumatic

FLASH TANK:

Flash Control:	Combustion device
Flash Control Efficiency:	98.00 %
Temperature:	135.0 deg. F
Pressure:	35.0 psig

STRIPPING GAS:

Source of Gas:	Dry Gas
Gas Flow Rate:	4.400 scfm

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device:	Combustion Device
Destruction Efficiency:	98.0 %
Excess Oxygen:	2.0 %
Ambient Air Temperature:	60.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: EQT - Curtisville Dehy PTE
File Name: Z:\Client\EQT Corporation\West Virginia\Curtisville\Projects\183901.0271 Dehy Replacement\03 Deliverables\2019-0122 Revised Application\Attach N - Emission Calculations\2019-0122 Curtisville_DehyCalcs_v1.1.ddf
Date: January 22, 2019

DESCRIPTION:

Description: Gas analysis sample date: 9/30

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.2084	5.001	0.9127
Ethane	0.0878	2.108	0.3848
Propane	0.0190	0.456	0.0833
Isobutane	0.0049	0.118	0.0216
n-Butane	0.0086	0.208	0.0379
Isopentane	0.0032	0.077	0.0140
n-Pentane	0.0023	0.054	0.0099
Cyclopentane	0.0012	0.028	0.0052
n-Hexane	0.0021	0.051	0.0092
Cyclohexane	0.0031	0.074	0.0136
Other Hexanes	0.0056	0.135	0.0246
Heptanes	0.0063	0.150	0.0274
Methylcyclohexane	0.0045	0.109	0.0198
2,2,4-Trimethylpentane	0.0003	0.007	0.0013
Benzene	0.0149	0.357	0.0652
Toluene	0.0258	0.620	0.1132
Ethylbenzene	0.0385	0.925	0.1688
Xylenes	0.0461	1.106	0.2019
C8+ Heavies	0.0017	0.040	0.0073
Total Emissions	0.4844	11.626	2.1218
Total Hydrocarbon Emissions	0.4844	11.626	2.1218
Total VOC Emissions	0.1882	4.517	0.8243
Total HAP Emissions	0.1278	3.066	0.5596
Total BTEX Emissions	0.1254	3.008	0.5490

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	10.4194	250.065	45.6368
Ethane	4.3923	105.416	19.2384
Propane	0.9510	22.824	4.1654
Isobutane	0.2467	5.921	1.0806
n-Butane	0.4324	10.377	1.8937
Isopentane	0.1599	3.838	0.7004
n-Pentane	0.1134	2.723	0.4969
Cyclopentane	0.0593	1.424	0.2599

n-Hexane	0.1056	2.534	0.4624
Cyclohexane	0.1549	3.719	0.6787
Other Hexanes	0.2807	6.736	1.2294
Heptanes	0.3125	7.501	1.3689
Methylcyclohexane	0.2266	5.438	0.9925
2,2,4-Trimethylpentane	0.0152	0.365	0.0665
Benzene	0.7443	17.864	3.2602
Toluene	1.2918	31.003	5.6580
Ethylbenzene	1.9264	46.234	8.4378
Xylenes	2.3050	55.321	10.0961
C8+ Heavies	0.0839	2.013	0.3674
Total Emissions	24.2215	581.315	106.0900
Total Hydrocarbon Emissions	24.2215	581.315	106.0900
Total VOC Emissions	9.4098	225.835	41.2148
Total HAP Emissions	6.3884	153.321	27.9810
Total BTEX Emissions	6.2676	150.422	27.4521

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.2161	5.187	0.9465
Ethane	0.1801	4.322	0.7888
Propane	0.0309	0.741	0.1353
Isobutane	0.0061	0.147	0.0268
n-Butane	0.0087	0.210	0.0382
Isopentane	0.0029	0.068	0.0125
n-Pentane	0.0017	0.040	0.0073
Cyclopentane	0.0002	0.005	0.0010
n-Hexane	0.0009	0.021	0.0039
Cyclohexane	0.0003	0.008	0.0014
Other Hexanes	0.0030	0.073	0.0133
Heptanes	0.0013	0.031	0.0056
Methylcyclohexane	0.0004	0.009	0.0016
2,2,4-Trimethylpentane	0.0001	0.003	0.0005
Benzene	0.0002	0.006	0.0010
Toluene	0.0003	0.006	0.0011
Ethylbenzene	0.0002	0.005	0.0010
Xylenes	0.0002	0.005	0.0008
C8+ Heavies	<0.0001	0.001	0.0001
Total Emissions	0.4536	10.886	1.9867
Total Hydrocarbon Emissions	0.4536	10.886	1.9867
Total VOC Emissions	0.0574	1.378	0.2514
Total HAP Emissions	0.0019	0.046	0.0084
Total BTEX Emissions	0.0009	0.022	0.0040

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	10.8052	259.325	47.3269
Ethane	9.0042	216.101	39.4384
Propane	1.5443	37.062	6.7639
Isobutane	0.3063	7.350	1.3414
n-Butane	0.4366	10.478	1.9122
Isopentane	0.1426	3.422	0.6245

n-Pentane	0.0834	2.001	0.3651
Cyclopentane	0.0109	0.262	0.0478
n-Hexane	0.0441	1.058	0.1930
Cyclohexane	0.0157	0.376	0.0686
Other Hexanes	0.1520	3.647	0.6656
Heptanes	0.0636	1.527	0.2787
Methylcyclohexane	0.0179	0.430	0.0784
2,2,4-Trimethylpentane	0.0060	0.143	0.0262
Benzene	0.0118	0.282	0.0515
Toluene	0.0130	0.312	0.0570
Ethylbenzene	0.0111	0.267	0.0488
Xylenes	0.0095	0.227	0.0415
C8+ Heavies	0.0016	0.039	0.0071
Total Emissions	22.6796	544.310	99.3366
Total Hydrocarbon Emissions	22.6796	544.310	99.3366
Total VOC Emissions	2.8702	68.884	12.5713
Total HAP Emissions	0.0954	2.290	0.4180
Total BTEX Emissions	0.0454	1.089	0.1988

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature: 60.00 deg. F
Excess Oxygen: 2.00 %
Combustion Efficiency: 98.00 %
Supplemental Fuel Requirement: 1.15e-001 MM BTU/hr

Component	Emitted	Destroyed
Methane	2.00%	98.00%
Ethane	2.00%	98.00%
Propane	2.00%	98.00%
Isobutane	2.00%	98.00%
n-Butane	2.00%	98.00%
Isopentane	2.00%	98.00%
n-Pentane	2.00%	98.00%
Cyclopentane	2.00%	98.00%
n-Hexane	2.00%	98.00%
Cyclohexane	2.00%	98.00%
Other Hexanes	2.00%	98.00%
Heptanes	2.00%	98.00%
Methylcyclohexane	2.00%	98.00%
2,2,4-Trimethylpentane	2.00%	98.00%
Benzene	2.00%	98.00%
Toluene	2.00%	98.00%
Ethylbenzene	2.00%	98.00%
Xylenes	2.00%	98.00%
C8+ Heavies	2.00%	98.00%

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages:	1.25
Calculated Dry Gas Dew Point:	0.30 lbs. H2O/MMSCF
Temperature:	45.0 deg. F
Pressure:	650.0 psig
Dry Gas Flow Rate:	60.0000 MMSCF/day
Glycol Losses with Dry Gas:	0.0302 lb/hr
Wet Gas Water Content:	Saturated
Calculated Wet Gas Water Content:	13.40 lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	18.31 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	2.21%	97.79%
Carbon Dioxide	99.73%	0.27%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.95%	0.05%
Propane	99.90%	0.10%
Isobutane	99.84%	0.16%
n-Butane	99.78%	0.22%
Isopentane	99.76%	0.24%
n-Pentane	99.67%	0.33%
Cyclopentane	98.49%	1.51%
n-Hexane	99.35%	0.65%
Cyclohexane	96.93%	3.07%
Other Hexanes	99.53%	0.47%
Heptanes	98.59%	1.41%
Methylcyclohexane	96.23%	3.77%
2,2,4-Trimethylpentane	99.45%	0.55%
Benzene	70.63%	29.37%
Toluene	57.03%	42.97%
Ethylbenzene	44.61%	55.39%
Xylenes	33.84%	66.16%
C8+ Heavies	98.49%	1.51%

FLASH TANK

Flash Control:	Combustion device
Flash Control Efficiency:	98.00 %
Flash Temperature:	135.0 deg. F
Flash Pressure:	35.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.96%	0.04%
Carbon Dioxide	41.31%	58.69%
Nitrogen	5.89%	94.11%
Methane	5.95%	94.05%
Ethane	18.59%	81.41%
Propane	31.29%	68.71%
Isobutane	40.86%	59.14%
n-Butane	47.34%	52.66%
Isopentane	51.08%	48.92%
n-Pentane	56.53%	43.47%

Cyclopentane	84.43%	15.57%
n-Hexane	70.22%	29.78%
Cyclohexane	91.08%	8.92%
Other Hexanes	64.44%	35.56%
Heptanes	83.05%	16.95%
Methylcyclohexane	92.95%	7.05%
2,2,4-Trimethylpentane	71.66%	28.34%
Benzene	98.52%	1.48%
Toluene	99.08%	0.92%
Ethylbenzene	99.48%	0.52%
Xylenes	99.64%	0.36%
C8+ Heavies	98.33%	1.67%

REGENERATOR

Regenerator Stripping Gas: Dry Product Gas

Stripping Gas Flow Rate: 4.4000 scfm

Component	Remaining in Glycol	Distilled Overhead
Water	63.25%	36.75%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.98%	99.02%
n-Pentane	0.88%	99.12%
Cyclopentane	0.59%	99.41%
n-Hexane	0.71%	99.29%
Cyclohexane	3.51%	96.49%
Other Hexanes	1.55%	98.45%
Heptanes	0.60%	99.40%
Methylcyclohexane	4.30%	95.70%
2,2,4-Trimethylpentane	2.09%	97.91%
Benzene	5.08%	94.92%
Toluene	7.97%	92.03%
Ethylbenzene	10.46%	89.54%
Xylenes	12.95%	87.05%
C8+ Heavies	12.24%	87.76%

STREAM REPORTS:

WET GAS STREAM

Temperature: 45.00 deg. F
Pressure: 664.70 psia
Flow Rate: 2.50e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)

Water	2.82e-002	3.35e+001
Carbon Dioxide	1.49e-001	4.32e+002
Nitrogen	3.87e-001	7.14e+002
Methane	8.72e+001	9.22e+004
Ethane	1.12e+001	2.21e+004
Propane	8.08e-001	2.35e+003
Isobutane	8.70e-002	3.33e+002
n-Butane	9.90e-002	3.79e+002
Isopentane	2.50e-002	1.19e+002
n-Pentane	1.20e-002	5.71e+001
Cyclopentane	1.00e-003	4.62e+000
n-Hexane	4.00e-003	2.27e+001
Cyclohexane	1.00e-003	5.55e+000
Other Hexanes	1.60e-002	9.09e+001
Heptanes	4.00e-003	2.64e+001
Methylcyclohexane	1.00e-003	6.47e+000
2,2,4-Trimethylpentane	5.00e-004	3.76e+000
Benzene	5.00e-004	2.57e+000
Toluene	5.00e-004	3.04e+000
Ethylbenzene	5.00e-004	3.50e+000
Xylenes	5.00e-004	3.50e+000
C8+ Heavies	5.00e-004	5.61e+000
Total Components	100.00	1.19e+005

DRY GAS STREAM

Temperature: 45.00 deg. F
Pressure: 664.70 psia
Flow Rate: 2.50e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.25e-004	7.41e-001
Carbon Dioxide	1.49e-001	4.31e+002
Nitrogen	3.87e-001	7.14e+002
Methane	8.72e+001	9.22e+004
Ethane	1.12e+001	2.21e+004
Propane	8.07e-001	2.35e+003
Isobutane	8.69e-002	3.33e+002
n-Butane	9.88e-002	3.78e+002
Isopentane	2.49e-002	1.19e+002
n-Pentane	1.20e-002	5.69e+001
Cyclopentane	9.85e-004	4.55e+000
n-Hexane	3.97e-003	2.26e+001
Cyclohexane	9.69e-004	5.38e+000
Other Hexanes	1.59e-002	9.04e+001
Heptanes	3.94e-003	2.60e+001
Methylcyclohexane	9.62e-004	6.23e+000
2,2,4-Trimethylpentane	4.97e-004	3.74e+000
Benzene	3.53e-004	1.82e+000
Toluene	2.85e-004	1.73e+000
Ethylbenzene	2.23e-004	1.56e+000
Xylenes	1.69e-004	1.18e+000
C8+ Heavies	4.93e-004	5.53e+000
Total Components	100.00	1.19e+005

LEAN GLYCOL STREAM

Temperature: 45.00 deg. F
Flow Rate: 1.00e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.90e+001	5.58e+003
Water	1.00e+000	5.63e+001
Carbon Dioxide	2.05e-012	1.15e-010
Nitrogen	1.79e-013	1.01e-011
Methane	6.85e-018	3.86e-016
Ethane	9.27e-008	5.22e-006
Propane	1.62e-009	9.15e-008
Isobutane	2.76e-010	1.55e-008
n-Butane	3.65e-010	2.06e-008
Isopentane	2.59e-005	1.46e-003
n-Pentane	1.70e-005	9.59e-004
Cyclopentane	6.22e-006	3.51e-004
n-Hexane	1.31e-005	7.40e-004
Cyclohexane	9.98e-005	5.62e-003
Other Hexanes	7.59e-005	4.27e-003
Heptanes	3.33e-005	1.88e-003
Methylcyclohexane	1.80e-004	1.02e-002
2,2,4-Trimethylpentane	5.61e-006	3.16e-004
Benzene	7.06e-004	3.98e-002
Toluene	1.99e-003	1.12e-001
Ethylbenzene	3.99e-003	2.25e-001
Xylenes	6.09e-003	3.43e-001
C8+ Heavies	2.06e-004	1.16e-002
Total Components	100.00	5.63e+003

RICH GLYCOL STREAM

Temperature: 45.00 deg. F
Pressure: 664.70 psia
Flow Rate: 1.01e+001 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.78e+001	5.58e+003
Water	1.56e+000	8.91e+001
Carbon Dioxide	2.02e-002	1.15e+000
Nitrogen	1.77e-003	1.01e-001
Methane	2.02e-001	1.15e+001
Ethane	1.94e-001	1.11e+001
Propane	3.94e-002	2.25e+000
Isobutane	9.08e-003	5.18e-001
n-Butane	1.45e-002	8.29e-001
Isopentane	5.11e-003	2.91e-001
n-Pentane	3.36e-003	1.92e-001
Cyclopentane	1.23e-003	7.01e-002
n-Hexane	2.60e-003	1.48e-001
Cyclohexane	3.08e-003	1.76e-001
Other Hexanes	7.50e-003	4.27e-001

Heptanes	6.58e-003	3.75e-001
Methylcyclohexane	4.46e-003	2.54e-001
2,2,4-Trimethylpentane	3.70e-004	2.11e-002
Benzene	1.40e-002	7.96e-001
Toluene	2.48e-002	1.42e+000
Ethylbenzene	3.79e-002	2.16e+000
Xylenes	4.66e-002	2.66e+000
C8+ Heavies	1.69e-003	9.65e-002
Total Components	100.00	5.70e+003

FLASH TANK OFF GAS STREAM

Temperature: 135.00 deg. F
Pressure: 49.70 psia
Flow Rate: 3.98e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.89e-001	3.57e-002
Carbon Dioxide	1.47e+000	6.77e-001
Nitrogen	3.23e-001	9.48e-002
Methane	6.42e+001	1.08e+001
Ethane	2.86e+001	9.00e+000
Propane	3.34e+000	1.54e+000
Isobutane	5.02e-001	3.06e-001
n-Butane	7.16e-001	4.37e-001
Isopentane	1.88e-001	1.43e-001
n-Pentane	1.10e-001	8.34e-002
Cyclopentane	1.48e-002	1.09e-002
n-Hexane	4.88e-002	4.41e-002
Cyclohexane	1.78e-002	1.57e-002
Other Hexanes	1.68e-001	1.52e-001
Heptanes	6.05e-002	6.36e-002
Methylcyclohexane	1.74e-002	1.79e-002
2,2,4-Trimethylpentane	4.99e-003	5.98e-003
Benzene	1.43e-002	1.18e-002
Toluene	1.35e-002	1.30e-002
Ethylbenzene	1.00e-002	1.11e-002
Xylenes	8.51e-003	9.47e-003
C8+ Heavies	9.03e-004	1.61e-003
Total Components	100.00	2.35e+001

FLASH TANK GLYCOL STREAM

Temperature: 135.00 deg. F
Flow Rate: 1.01e+001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.82e+001	5.58e+003
Water	1.57e+000	8.91e+001
Carbon Dioxide	8.39e-003	4.77e-001
Nitrogen	1.04e-004	5.93e-003
Methane	1.20e-002	6.83e-001
Ethane	3.62e-002	2.06e+000
Propane	1.24e-002	7.03e-001

Isobutane	3.73e-003	2.12e-001
n-Butane	6.91e-003	3.92e-001
Isopentane	2.62e-003	1.49e-001
n-Pentane	1.91e-003	1.08e-001
Cyclopentane	1.04e-003	5.92e-002
n-Hexane	1.83e-003	1.04e-001
Cyclohexane	2.82e-003	1.60e-001
Other Hexanes	4.85e-003	2.75e-001
Heptanes	5.49e-003	3.12e-001
Methylcyclohexane	4.16e-003	2.36e-001
2,2,4-Trimethylpentane	2.66e-004	1.51e-002
Benzene	1.38e-002	7.84e-001
Toluene	2.47e-002	1.40e+000
Ethylbenzene	3.79e-002	2.15e+000
Xylenes	4.66e-002	2.65e+000
C8+ Heavies	1.67e-003	9.49e-002
Total Components	100.00	5.68e+003

FLASH GAS EMISSIONS

Flow Rate: 1.49e+003 scfh
Control Method: Combustion Device
Control Efficiency: 98.00

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.23e+001	4.41e+001
Carbon Dioxide	3.71e+001	6.41e+001
Nitrogen	8.62e-002	9.48e-002
Methane	3.43e-001	2.16e-001
Ethane	1.53e-001	1.80e-001
Propane	1.78e-002	3.09e-002
Isobutane	2.68e-003	6.13e-003
n-Butane	3.83e-003	8.73e-003
Isopentane	1.01e-003	2.85e-003
n-Pentane	5.88e-004	1.67e-003
Cyclopentane	7.93e-005	2.18e-004
n-Hexane	2.60e-004	8.81e-004
Cyclohexane	9.48e-005	3.13e-004
Other Hexanes	8.98e-004	3.04e-003
Heptanes	3.23e-004	1.27e-003
Methylcyclohexane	9.29e-005	3.58e-004
2,2,4-Trimethylpentane	2.66e-005	1.20e-004
Benzene	7.66e-005	2.35e-004
Toluene	7.19e-005	2.60e-004
Ethylbenzene	5.35e-005	2.23e-004
Xylenes	4.54e-005	1.89e-004
C8+ Heavies	4.83e-006	3.23e-005
Total Components	100.00	1.09e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.04e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.63e+001	3.27e+001
Carbon Dioxide	4.33e-001	5.22e-001
Nitrogen	1.06e-001	8.14e-002
Methane	2.37e+001	1.04e+001
Ethane	5.33e+000	4.39e+000
Propane	7.87e-001	9.51e-001
Isobutane	1.55e-001	2.47e-001
n-Butane	2.71e-001	4.32e-001
Isopentane	8.08e-002	1.60e-001
n-Pentane	5.73e-002	1.13e-001
Cyclopentane	3.09e-002	5.93e-002
n-Hexane	4.47e-002	1.06e-001
Cyclohexane	6.72e-002	1.55e-001
Other Hexanes	1.19e-001	2.81e-001
Heptanes	1.14e-001	3.13e-001
Methylcyclohexane	8.42e-002	2.27e-001
2,2,4-Trimethylpentane	4.85e-003	1.52e-002
Benzene	3.48e-001	7.44e-001
Toluene	5.11e-001	1.29e+000
Ethylbenzene	6.62e-001	1.93e+000
Xylenes	7.92e-001	2.31e+000
C8+ Heavies	1.80e-002	8.39e-002
Total Components	100.00	5.76e+001

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 6.90e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	7.14e+001	2.08e-001
Ethane	1.61e+001	8.78e-002
Propane	2.37e+000	1.90e-002
Isobutane	4.67e-001	4.93e-003
n-Butane	8.18e-001	8.65e-003
Isopentane	2.44e-001	3.20e-003
n-Pentane	1.73e-001	2.27e-003
Cyclopentane	9.30e-002	1.19e-003
n-Hexane	1.35e-001	2.11e-003
Cyclohexane	2.02e-001	3.10e-003
Other Hexanes	3.58e-001	5.61e-003
Heptanes	3.43e-001	6.25e-003
Methylcyclohexane	2.54e-001	4.53e-003
2,2,4-Trimethylpentane	1.46e-002	3.04e-004
Benzene	1.05e+000	1.49e-002
Toluene	1.54e+000	2.58e-002
Ethylbenzene	2.00e+000	3.85e-002
Xylenes	2.39e+000	4.61e-002
C8+ Heavies	5.42e-002	1.68e-003
Total Components	100.00	4.84e-001

Certificate of Analysis

Number: 2030-14100121-005A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Gary Vermillion
Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

Oct. 16, 2014

Field: EQT
Station Name: Curtisville Compressor
Sample Point:
Cylinder No: 0377
Analyzed: 10/15/2014 09:14:28 by CC43

Sampled By: GC-GAS
Sample Of: Gas Spot
Sample Date: 09/30/2014 09:45
Sample Conditions: 772 psig, @ 58 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia
Nitrogen	0.387	0.601	
Carbon Dioxide	0.149	0.363	
Methane	87.236	77.558	
Ethane	11.170	18.614	2.994
Propane	0.808	1.975	0.224
Iso-Butane	0.087	0.280	0.028
n-Butane	0.099	0.319	0.031
Iso-Pentane	0.025	0.100	0.009
n-Pentane	0.012	0.048	0.004
Hexanes	0.021	0.074	0.006
Heptanes Plus	0.006	0.068	0.003
	100.000	100.000	3.299

GPM TOTAL C2+	3.299
GPM TOTAL C3+	0.305
GPM TOTAL iC5+	0.022

Physical Properties	Total	C7+
Relative Density Real Gas	0.6244	3.6850
Calculated Molecular Weight	18.04	106.73
Compressibility Factor	0.9974	
GPA 2172-09 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1114	5751
Water Sat. Gas Base BTU	1094	5651

Comments: H2O Mol% : 1.740 ; Wt% : 1.738

Patti L. Pierro

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis

Number: 2030-14100121-005A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

Gary Vermillion
Gas Analytical Services
PO Box 1028
Bridgeport, WV 26330

Oct. 16, 2014

Field: EQT
Station Name: Curtisville Compressor
Sample Point:
Cylinder No: 0377
Analyzed: 10/15/2014 09:14:28 by CC43

Sampled By: GC-GAS
Sample Of: Gas Spot
Sample Date: 09/30/2014 09:45
Sample Conditions: 772 psig, @ 58 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %
Carbon Dioxide	0.149	0.363
Hydrogen Sulfide	N/R	N/R
Nitrogen	0.387	0.601
Methane	87.236	77.558
Ethane	11.170	18.614
Propane	0.808	1.975
Iso-Butane	0.087	0.280
n-Butane	0.099	0.319
Iso-Pentane	0.025	0.100
n-Pentane	0.012	0.048
Cyclopentane	0.001	0.003
n-Hexane	0.004	0.016
Cyclohexane	0.001	0.003
Other Hexanes	0.016	0.050
n-Heptane	0.001	0.006
Other Heptanes	0.003	0.028
Methylcyclohexane	0.001	0.005
2,2,4-Trimethylpentane	NIL	NIL
Benzene	NIL	0.002
Toluene	NIL	0.002
Ethylbenzene	NIL	NIL
Xylenes	NIL	0.002
C8 + Heavies	NIL	0.025
	100.000	100.000

Patti L. Pecoro

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

ATTACHMENT O

Monitoring/Recordkeeping/Reporting/Testing Plans

Monitoring, Recording, Reporting, and Testing Plan

Plan Type	Emission Unit	Pollutant	Requirements	Frequency	Method of Measurement
Monitoring	Glycol Dehydration Units	N/A	Natural Gas Throughput	Annual	Flow Meter
Record Keeping	Glycol Dehydration Units	VOC/HAP	Maintain emissions below permit limits.	Annual	GRI_GLY Calc

ATTACHMENT P

Public Notice

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Equitrans, LP has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a construction permit application for an existing natural gas compressor station (the Curtisville Compressor Station) located off Laurel Run Road near Mannington in Marion County, West Virginia. The site latitude and longitude coordinates are: 39.52345 N, -80.43980 W. The proposed change includes the replacement of the existing dehydration unit with a new unit, which will be completed in 2019.

The applicant estimates the potential increase in the following Regulated Air Pollutants associated with the project will be:

Particulate Matter (PM) = 0.23 tpy
Sulfur Dioxide (SO2) = 0.02 tpy
Volatile Organic Compounds (VOC) = 1.45 tpy
Carbon Monoxide (CO) = 2.49 tpy
Nitrogen Oxides (NOx) = 2.96 tpy
Total Hazardous Air Pollutants (HAPs) = 0.69 tpy
n-hexane = 0.03 tpy
Toluene = 0.14 tpy
Ethylbenzene = 0.20 tpy
Benzene = 0.08 tpy
Xylenes = 0.24 tpy
Carbon Dioxide Equivalents (CO_2e) = 3,905 tpy

Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated on [INSERT DATE]

By: Equitrans, LP
Jack Mackin, Vice President of Operations
2200 Energy Dr.
Canonsburg, PA 15317

ATTACHMENT S

Title V Permit Revision Information

Attachment S

Title V Permit Revision Information

1. New Applicable Requirements Summary	
Mark all applicable requirements associated with the changes involved with this permit revision:	
☒ SIP	☐ FIP
☒ Minor source NSR (45CSR13)	☐ PSD (45CSR14)
☐ NESHAP (45CSR15)	☐ Nonattainment NSR (45CSR19)
☐ Section 111 NSPS (Subpart(s))	☐ Section 112(d) MACT standards (Subpart(s))
☐ Section 112(g) Case-by-case MACT	☐ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts.	☐ Stratospheric ozone (Title VI)
☐ Tank vessel reqt., section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☐ 45CSR27 State enforceable only rule
☐ 45CSR4 State enforceable only rule	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ Compliance Assurance Monitoring (40CFR64) (1)
☐ NO_x Budget Trading Program Non-EGUs (45CSR1)	☐ NO_x Budget Trading Program EGUs (45CSR26)

(1) If this box is checked, please include **Compliance Assurance Monitoring (CAM) Form(s)** for each Pollutants Specific Emission Unit (PSEU) (See Attachment H to Title V Application). If this box is not checked, please explain why **Compliance Assurance Monitoring** is not applicable:

There are no large pollutant specific emission units. Therefore, CAM is not required at this time.

2. Non Applicability Determinations
List all requirements, which the source has determined not applicable to this permit revision and for which a permit shield is requested. The listing shall also include the rule citation and a rationale for the determination.
☐ **Permit Shield Requested** *(not applicable to Minor Modifications)*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

3. Suggested Title V Draft Permit Language

Are there any changes involved with this Title V Permit revision outside of the scope of the NSR Permit revision? ☐ Yes ☒ No If Yes, describe the changes below.

Also, please provide **Suggested Title V Draft Permit language** for the proposed Title V Permit revision (including all applicable requirements associated with the permit revision and any associated monitoring /recordkeeping/ reporting requirements), OR attach a marked up pages of current Title V Permit. Please include appropriate citations (Permit or Consent Order number, condition number and/or rule citation (e.g. 45CSR§7-4.1)) for those requirements being added / revised.

4. Active NSR Permits/Permit Determinations/Consent Orders Associated With This Permit Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
NA		
	/ /	

5. Inactive NSR Permits/Obsolete Permit or Consent Orders Conditions Associated With This Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
NA		
	/ /	

6. Change in Potential Emissions

Pollutant	Change in Potential Emissions (+ or -), TPY
PM	0.23
SO2	0.02
CO	2.49
NOx	2.96
HAP	0.69
VOC	1.45
N-Hexane	0.03
Benzene	0.08
CO2(e)	3,905

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

7. Certification For Use Of Minor Modification Procedures ***(Required Only for Minor Modification Requests)***

Note:	*This certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete. The criteria for allowing the use of Minor Modification Procedures are as follows:*

i. Proposed changes do not violate any applicable requirement;

ii. Proposed changes do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;

iii. Proposed changes do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient air quality impacts, or a visibility increment analysis;

iv. Proposed changes do not seek to establish or change a permit term or condition for which there is no underlying applicable requirement and which permit or condition has been used to avoid an applicable requirement to which the source would otherwise be subject (synthetic minor). Such terms and conditions include, but are not limited to a federally enforceable emissions cap used to avoid classification as a modification under any provision of Title I or any alternative emissions limit approved pursuant to regulations promulgated under § 112(j)(5) of the Clean Air Act;

v. Proposed changes do not involve preconstruction review under Title I of the Clean Air Act or 45CSR14 and 45CSR19;

vi. Proposed changes are not required under any rule of the Director to be processed as a significant modification;

Notwithstanding subparagraph 45CSR§30-6.5.a.1.A. (items i through vi above), minor permit modification procedures may be used for permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, to the extent that such minor permit modification procedures are explicitly provided for in rules of the Director which are approved by the U.S. EPA as a part of the State Implementation Plan under the Clean Air Act, or which may be otherwise provided for in the Title V operating permit issued under 45CSR30.

Pursuant to 45CSR§30-6.5.a.2.C., the proposed modification contained herein meets the criteria for use of Minor permit modification procedures as set forth in Section 45CSR§30-6.5.a.1.A. The use of Minor permit modification procedures are hereby requested for processing of this application.

(Signed): _____ Date: 1 / 28 / 19
(Please use blue ink) *(Please use blue ink)*

Named (typed): *Jack Mackin* Title: *Vice President of Operations*

Note: Please check if the following included (if applicable):

☐	Compliance Assurance Monitoring Form(s)
☐	Suggested Title V Draft Permit Language

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.